

# Coin Usage and Exchange Rates in Badoer's *Libro dei Conti*

CÉCILE MORRISSON

The Venetian merchant-banker Giacomo Badoer lived in Constantinople from 2 September 1436 to 26 February 1440. Like all Italian merchant-bankers of his time he must have kept several account books, or at least a journal, which he mentions several times in his *Libro dei Conti* (e.g., c. (*carta*) 17, p. 34, lines 2, 7, 19; c. 40, p. 80, line 33; c. 41, p. 82, line 9, etc.), and a ledger (the *Libro*). The latter is kept in the Archivio di Stato in Venice (Cinque Savi alla Mercanzia, ser. 1, Diversorum, busta 958). The *Libro dei Conti* is one of the earliest completely preserved examples—or nearly completely preserved, since the last fifteen pages are missing but can be partly reconstructed from references to them in other accounts—of double-entry bookkeeping, though the practice can be traced to the early fourteenth century (1340 or earlier<sup>1</sup>). Whereas other Venetian account books of the early fifteenth century still use Roman numerals, Badoer makes systematic use of Arabic ones.

The *Libro* had been known for more than a century and was commented upon in an accounting perspective as early as 1880 in a *prolusione* (inaugural lecture) by Fabio Besta in Venice.<sup>2</sup> Its publication had been recommended to the Reale Commissione per la

For valuable help on many points, I am grateful to several friends and colleagues: Jacques Lefort, Michael Bates, Miguel Crusafont i Sabater, Philip Grierson, Peter Spufford, Lucia Travaini, as well as to an anonymous reader of the manuscript to whom I am indebted for an informative and extensive critical review. Giovanni Bertelè also pointed out several inaccuracies and provided valuable information on older literature on Badoer's *Libro*. See G. Bertelè, ed., *Il Libro dei Conti di Giacomo Badoer . . . Complemento* (Padua, 2001), 3–8.

<sup>1</sup>See R. de Roover, "The Development of Accounting prior to Luca Pacioli according to the Account Books of Medieval Merchants," in *Business, Banking, and Economic Thought in Late Medieval and Early Modern Europe. Selected Studies of Raymond de Roover*, ed. J. Kirshner (Chicago, 1974), 119–80, esp. 131–43, on the various account books of merchant-bankers that have come down to us, mentioning (1) the ledger, called *libro dei debitori e creditori* by Florentines, *quaderno* by Venetians; (2) the register of purchases and sales; and (3) the cash book. De Roover (*ibid.*, 164) considers Badoer's book as an "illustration of venture accounting," "kept in perfect double-entry," a document of "exceptional interest." F. C. Lane, *Andrea Barbarigo, Merchant of Venice, 1418–1449* (Baltimore, Md., 1944), 153–58, concludes from the ledgers of the Soranzo fraterna (1406–36), Andrea Barbarigo (1430–40), and Badoer that "double entry was well known and commonly used at Venice at the beginning of the fifteenth century."

<sup>2</sup>F. Besta, *Prolusione letta nella solenne apertura degli studi per l'anno scolastico 1880–81 alla Reale Scuola superiore di Commercio in Venezia* (Venice, 1880), 41 n. (facsimile reprint, Bari, 1987). See also V. Alfieri, *La partita doppia applicata alle scritture delle antiche aziende mercantili veneziane* (Turin, 1891), 28, 29, 45, 56, 82–101, 147; H. Sieveking, "Aus venezianischen Handlungsbüchern," *Schmallers Jahrbuch* 25 (1901) and 26 (1902); F. Besta, *Corso di ragioneria* (Venice, 1891) and idem., *La ragioneria*, I, vol. 3, *Ragioneria generale* (1916), 310–16. See

Pubblicazione dei Documenti Finanziari della Repubblica di Venezia, created in August 1897, by the same Fabio Besta, professor in the Regia Scuola superiore di Commercio in Venice, vice president and *relatore* of the Commission.<sup>3</sup> In the late 1940s Tommaso Bertelè learned of the historical interest of the document in the course of his studies of late Byzantine monetary history and had it transcribed for his personal use by the then retired former director of the Archivio di Stato of Florence and superintendent of the Tuscan archives, Umberto Dorini. Bertelè soon realized the extreme importance of the text and managed to have it published in 1956 under the joint signatures of Dorini and Bertelè, in that order, although the latter was responsible for the greater part of the work.<sup>4</sup> The exhaustive edition of the text followed a near facsimile format, reproducing the pages of debit and credit of each *carta* facing each other and keeping the columnar

T. Zerbi, *Le origini della partita doppia. Gestioni aziendali e situazioni di mercato nei secoli XIV e XV* (Milan, 1952), 396–412 and Lane, “Barbarigo,” 146–47.

<sup>3</sup> In a lithographed report dated 25 June 1898 which did not appear in the Archivio Veneto. I owe a copy to the kindness of Giovanni Bertelè. This report was written “adempiendo all’obbligo fattomi dalla deliberazione . . . nell’adunanza del 24 ottobre prossimo passato.” Note that Besta recommends publishing, as a “valuable complement” to financial documents, the ledgers of Giacomo Badoer and Andrea Barbarigo: “varrebbe non solamente a illustrare la storia del commercio in quel periodo di splendore ma anche a chiarir nel modo migliore quali dazi et quali gravezze e in quale misura i negozianti realmente pagassero.”

<sup>4</sup> *Il Libro dei Conti di Giacomo Badoer*, ed. U. Dorini and T. Bertelè (Rome, 1956), one vol., 22.5 × 29 cm, xvi–864 pp., five plates; price 10,000 lire. The book was still available for sale in the mid-1980s, a fact worth underlining in a period when many publishers, including state-owned institutions, often destroy valuable source publications. Oral communications to the author on the origin and development of the enterprise by Tommaso Bertelè, and later by his son, Giovanni Bertelè, are confirmed by the following paragraphs from a letter sent by T. Bertelè to Howard L. Adelson, 21 January 1965: “L’edizione e commento del Badoer è diventato, senza che lo prevedessi, il lavoro più lungo, faticoso e—credo—utile della mia vita [on its completion, he was sixty-four years old]. Avendolo apprezzato al suo valore dopo secoli di incomprensione, ne promossi la trascrizione a cura di un vecchio paleografo amico: non si pensava allora alla pubblicazione e il documento doveva servire in primo luogo per i miei studi. Poichè vidi poi che l’importanza—che ritenevo già grande—era veramente grandissima perché ci dava un quadro, vasto ed unico, di tutta la vita economica bizantina nel sec. XV, degli amici, con cui ne parlai, raccomandarono ed ottenero facilmente la pubblicazione.”

“Pregai allora il trascrittore di rileggere il suo manoscritto, ciò che egli fece ma, convinto che la trascrizione fosse esatta, si limitò specialmente a ritoccare la punteggiatura. Quando mi giunsero le bozze, dovetti constatare con vero terrore che le somme laterali di certi conti non erano esatte perché il trascrittore aveva saltato qualche riga; che molte parole non corrispondevano nella forma a quella del codice perché il trascrittore le aveva inconsciamente modernizzate, ecc. Errori di tal genere, alcuni gravi, altri di forma, ricorrevano nella media di circa 15 per pagina. Che fare? Tutto considerato, mi assunsi io stesso l’onere di collazionare ogni parola e cifra su una copia fotografica del codice: il lavoro durò un anno e mezzo e le correzioni furono circa 15.000. Se l’opera fosse stata composta con ‘linotype’, le bozze sarebbero state buttate nel cestino e mai rifatte. Invece erano state composte colla ‘monotype’ ciò che permise di correggere senza dover ristampare tutta la pagina: la correzione durò a lungo e fu molto costosa, ma posso dire che (ad eccezione di un centinaio di piccoli errori che mi sono sfuggiti) l’edizione fornisce accuratamente il testo del opera. [These small errors are listed by Giovanni Bertelè in his *Complemento*, 17–18.]

“Il trascrittore fu il primo a riconoscere i suoi errori, che dipendevano da varie cause: anzitutto egli era abituato a documenti toscani, che gli stavano a cuore; non comprendeva bene il dialetto veneziano e poco ne sentiva l’interesse.” This throws further light on a process described in more diplomatic terms in Bertelè’s presentation in “*Il Libro dei Conti di Giacomo Badoer ed il problema dell’iperpero bizantino nella prima metà del Quattrocento*,” *Accademia Nazionale dei Lincei, XII Convegno “Volta. Oriente e Occidente nel Medioevo* (Rome, 1956 [1957]), 242–63, esp. 243–44.

F. Besta, *Prolusione letta nella solenne apertura degli studi per l’anno scolastico 1880–81 alla R. Scuola superiore di commercio in Venezia* (Venice, Tipografia dell’Istituto Coletti, 1880, 41 (facsimile reprint, Bari, Caducci editore, 1987).

placement of the figures in the right margin (see the Appendix). For the sake of clarity, all references to the *Libro* in this article include the *carta*, page, and line number of the printed edition (c. 00, p. 00, line 00). This may seem cumbersome or confusing; I have, however, kept the *carta* number for two reasons: it is used to refer to the text in articles or books published before the 1956 edition, and it is the cross-reference between the various accounts used by Badoer himself.

In 1976 Philip Grierson<sup>5</sup> wrote that “the immense account book of the Venetian Giacomo Badoer . . . is of great value to the economic historian through its recording of the prices of goods and commodities, but it tells the numismatist little that he did not already know.” This at first sight surprising statement was justified on the ground that “this immense volume . . . is difficult to use, since a projected second volume of notes, explanatory matter, and index has never appeared.” For the same reason, Anthony Cutler called the source “a mixed blessing or rather a blessing in disguise.”<sup>6</sup>

Tommaso Bertelè in fact had assembled some of the planned explanatory articles. A few were published,<sup>7</sup> but some remained unpublished in his files.<sup>8</sup> Other invited authors, such as Paul Lemerle, never wrote their promised essays in view of the slow progress of the work. However, Bertelè had accomplished a substantial amount of work on the index, leaving aside only weights and measures. Mr. Giovanni Bertelè has now completed and revised this index which has just been published in Padua (*Il Libro dei Conti di Giacomo Badoer. Costantinopoli (1436–1440. Complemento)*). The analytical index is in fact divided into several parts (General index, Commodities, People, Place names, Accounts' headings [Titolo dei Conti]) and accompanied by a concordance between these various indexes. A few years ago, Mr. Giovanni Bertelè very generously entrusted me with these indexes and the rest of his father's file. Jacques Lefort and myself are preparing a publication of the planned book on revised lines in the series *Réalités byzantines*, with contributions of other scholars. A volume of instructions on how to use the document including a unified index, and introductions to its codicology, accounting methods, metrology, legal, numismatic, and monetary matters, as well as finance and banking; volume two will contain a reprint of Bertelè's “Il giro d'affari” and studies on Badoer and the Badoer family, Badoer's household in Constantinople and his commercial activities, maritime life, prices, and wages in Constantinople, and Byzantines, Turks, and Italians in the document.

Those who have already used the *Libro* for their research are familiar with its sophisticated technicalities as well as the size and breadth of its documentation and will readily understand that the present article can offer only a preliminary outline of what the docu-

<sup>5</sup> P. Grierson, “Medieval Numismatics,” in *Medieval Studies: An Introduction*, ed. J. Powell (Syracuse, N.Y., 1976), 103–36, repr. in Grierson, *Later Medieval Numismatics (11th–16th Centuries)* (London, 1979), I, 118 and n. 23.

<sup>6</sup> A. Cutler, “The Stavraton: Evidence for an Elusive Byzantine Type,” *ANSMN* 11 (1964): 237–44, esp. 237.

<sup>7</sup> Including Bertelè's two articles: “Liperpero bizantino dal 1261 al 1453,” *RIN*, 5th ser., 59 (1957): 70–89 (which reproduces, adding a plate of illustrations, the final part, pp. 251–63, of “Il Libro dei Conti di Giacomo Badoer ed il problema dell'iperpero bizantino”) and “Il giro d'affari di Giacomo Badoer,” in *Akten des XI. Internationalen Byzantinistenkongresses, München 1958* (Munich, 1960), 48–57, as well as G. Astuti, “Le forme giuridiche della attività mercantile nel Libro dei Conti di Giacomo Badoer,” *Annali della storia del diritto* (1968–69): 65–130.

<sup>8</sup> F. Babinger's “I Turchi nel libro dei conti di G. Badoer”; R. de Roover's “Opérations financières. Lettres de change. Virements en banque. Dépôts”; and R. Morozzo's “Notizie sui Badoer da Santa Giustina, Giacomo Badoer, Patrizio veneziano del '400.”

ment can tell about coin usage and exchange in Constantinople. This is only the first step of a larger inquiry into Badoer's monetary and nonmonetary affairs, one that would assess the respective parts played by barter on the one hand and monetary transactions on the other and their respective contexts, or the proportion of cash versus bank payments, and analyze Badoer's trading in bills of exchange, a very important aspect of his business as a merchant-banker in Constantinople. Thus the aim of this short study is simply to gather and put some order into the data of the *Libro* concerning the coins used by Badoer and his agents or correspondents, as well as their relative valuation and exchange rates in Constantinople or in the various Mediterranean or Black Sea centers at which they called.

Badoer never left Constantinople, where he was the correspondent or agent of some Venetian firms and especially of his brother Girolamo. He traded with many countries using a variety of moneys of account and currencies. But his ledger is not a merchandise handbook or manual like Pegolotti's, and monetary systems, coin lists, and exchange rates have to be reconstructed from his entries and checked against contemporary information or surviving coins, as will be attempted in what follows.

#### MONEYS OF ACCOUNT

##### *Byzantine Perperi and Carati*

Giacomo Badoer keeps all his accounts in perperi and carats ( $1/24$  hyperpyron),<sup>9</sup> but many of his first entries add a *quarta*. This is not a measure, but simply a fraction, a quarter carat, which he also uses in rare instances for other currencies.<sup>10</sup> On 20 February 1437, for instance, he shares with Antonio Chontarini half of the net profit ("trato neto") of their common venture on "pani loesti" (woolens of Alost in Flanders) and ascribes each of them ("per la mità") 700 hyperpyra, 5 carats,  $q^a$  2.<sup>11</sup> He must soon have realized that such a tiny division ( $1/96$  hyperpyron and therefore  $\pm 1/288$  ducat) was of little use. He last mentioned it on 11 May 1437 (c. 36, p. 72, line 24) and from 26 July 1437 on replaced it, when necessary, with mentions of  $1/2$  carat only (c. 57, p. 115, line 13).

##### *The Venetian Ducat*

In 1342 the Venetian ducat was divided into 24 grossi (of account), each of them divided into 32 piccoli.<sup>12</sup>

Ducat	Grossi	Piccoli
1	24	768
	1	32

<sup>9</sup>For the origins of this system of account, see T. Bertelè, "Liperpero"; M. Hendy, *Studies in the Byzantine Economy* (Cambridge, 1985), 539–41; P. Grierson, *Catalogue of the Byzantine Coins in the Dumbarton Oaks Collection and in the Whittemore Collection*, vol. 5 (Washington, D.C., 1999), 42 (hereafter *DOC* 5); and F. C. Lane and R. Mueller, *Money and Banking in Medieval and Renaissance Venice* (Baltimore, Md., 1985), 417.

<sup>10</sup>C. 56, p. 113, lines 11–13 and 16.

<sup>11</sup>C. 11, p. 22, lines 14–16.

<sup>12</sup>Lane and Mueller, *Money*, 352–53; J. Day, "Naissance et mort des monnaies de compte (XIIIe–XVIIIe siècle)," *RN* 153 (1998): 335–43, esp. 336; P. Grierson, "La moneta di conto nel Medioevo," *RIN* 95 (1993): 603–14. See also P. Grierson, *DOC* 5:35.

Compare c. 398, p. 798, line 31, where a bill of exchange of 107 ducats, 20 grossi, and 22 piccoli is to be received at the rate of 2 perperi and 22 carats to the ducat. When another division is found, as sometimes happens (see below), it is another ducat.

### *Cretan Perperi (de Chandia)*

The same pattern of grossi and piccoli applies to another Venetian money of account, the *perperi de Chandia*, which other sources call *yperpera in Creta currentia*,<sup>13</sup> which were also divided into grossi et piccoli<sup>14</sup> and then valued at 1½ to the Constantinople perpero, that is, ⅔ of a gold ducat. On 21 May 1438, for instance, the account of Marco Filomati is credited for the expenses incurred concerning ingots of lead “which he says amounted to 64 perperi, 2 grossi, and 8 piccoli of Chandia at one and a half perpero of Chandia to one Constantinopolitan perpero” (“a perparo 1½ de Chandia per perparo j° de Costantinopoli”).<sup>15</sup>

### *Morean Perperi*

Morean perperi appear in the accounts concerning the oil of Coron as perperi (implying of Coron)<sup>16</sup> and are reckoned in *soldi*, referring to their division into 20 soldi di piccoli and 240 piccoli.<sup>17</sup> The Morean perpero was thus equivalent to one pound of account. It was valued at 2¼ to the Constantinople perpero and thus worth two-thirds of the Cretan one.

### *The Tornexe*

When the *tornexe* is reckoned as ⅓ of a Turkish asper (⅓ of a hyperpyron), as is the case in the account of the venture to Gallipoli (“viazo de Garipoi”) and in many other quotations of the Turkish asper, the actual Byzantine coin worth ⅓ of the hyperpyron becomes a money of account.<sup>18</sup>

<sup>13</sup> See T. Bertelè, “Moneta veneziana e moneta bizantina (secoli XII–XV),” in *Venezia e il Levante fino al secolo XVI*, ed. A. Pertusi, vol. 1 (Florence, 1973), 109.

<sup>14</sup> A. M. Stahl, *The Venetian Tornesello: A Medieval Colonial Coinage* (New York, 1985), 53–55; Lane and Mueller, *Money*, 425–27.

<sup>15</sup> C. 83, p. 168, line 18.

<sup>16</sup> See Bertelè, “Moneta veneziana,” 109, quoting Venetian notarial documents dated 1289–93 about the “yperpera currentia in Corona,” valued in Venice at 10 grossi. See Stahl, *Tornesello*; Lane and Mueller, *Money*, 426 n. 32 and 432; and L. Travaini, “Un sistema di conto poco conosciuto: La ‘mano da quattro,’” *RN* 153 (1998): 327–34.

<sup>17</sup> See c. 188, p. 378, lines 19–20: in April and May 1438 a total of “2,228 perperi, 8 soldi, and 3 tornesi” (“perp. 2228 s. 8 t° 3”) [corresponding to various oil purchases in Coron] is converted into Constantinopolitan perperi at the rate of 45 soldi to one perpero (“che val a soldi 45 [Bertelè notes: “152 corretto in 45”] el perparo de Chostantinopoli . . . perp. 990 car. 10”). See also Stahl, *Tornesello*, and Lane and Mueller, *Money*, 432, quoting this entry of Badoer. On the perpero of Morea, see Lane and Mueller, *Money*, 426 n. 42 and 432.

<sup>18</sup> See c. 125, p. 252, line 13: “Viazo de Garipoi a dì 31 mazo [1437] per cassa per l’amontar de asp. 3000 che i mandò per Dimitri Argiti de Chandia, montano a aspro 11, mancho tornexi 5, a perparo c. 186 perp 280 car. 13.”

### *The Bezant of Tana*

The bezant of Tana appears in various accounts related to Badoer's transactions with Tana, notably with Francesco Corner, a Venetian merchant residing there.<sup>19</sup> The bezant is rated at 13 (and 2 tangi) to the ducat and 4 to the perpero (c. 219, p. 441, lines 24 and 26), which makes it impossible to consider it a real coin ( $\frac{1}{13}$  of a ducat being some 0.27 g gold). It is a multiple of the local asper, 6 of which made up a bezant.<sup>20</sup>

### *The Sicilian Ounce*

Another money of account in the *Libro* is the Sicilian ounce, which appears only once in the account of the "venture to Messina and Saragoxa" (Syracuse), where copper had been sold for "456 florins, 2 tarì, and 3 grains" = "91 ounces, 7 tarì, and 3 grains" valued at "5 florins to the ounce" and reckoned a few lines later at 13 perperi to the ounce.<sup>21</sup> This *moneta di conto*, instead of being, like those previously mentioned, derived from former real denominations (like the grosso for Venice), was a purely abstract one based on the theoretical weight of a gold ounce (of 26.73 g) divided into 30 tarì (tari-weights<sup>22</sup>) or tareni of 20 grains each.<sup>23</sup>

Ounce	[Florin]	Tarì	Grain
1	5	30	600
	1	6	120
		1	20

<sup>19</sup>C. 74, p. 151, lines 8–9.

<sup>20</sup>See below, p. 232.

<sup>21</sup>C. 40, p. 81, lines 6–14, credit, 22 August 1437: "a di 22 avosto 1437 per Nofrio da Chalzi per l'amontar del trato neto de hi  $\frac{2}{3}$  de hi chontrascriti chant. 49 r° 16 de rame, el qual rame per so chonto el me asigna eser pexà neto in Saragoxa e Mesina chant. 27 r° 24, vendudo a fiorini 16 $\frac{3}{4}$  e a fiorini 17, e a 15 $\frac{1}{2}$  el chanter, asigna montar in tuto fiorini 456 tarì 2 grane 3, che val a fiorini 5 l'onza . . . onze 91 tarì 7 e grane 3, bate per spexe, e prima, per nolo onze 2 tarì 10, e per spexe de pexar, ostelazo e mandar da Saragoxa a Mesina e altre manzarie onze 3 tarì 12 grane 5, e per sansarla tarì 14, e per doana de Saragoxa a 2 per c°., tarì 25, e per doana de Mesina a 3 per c°. de quel vendudo a Mesina onza jà tarì 12 grane 4, e per provixion de tuto a 2 per c°., onza jà tarì 23 grane 8, suma queste spexe onze 10 tarì 6 grane 17, resta neto onze 81 tarì 0 grane 3, val a perp. 13 l'onza, monta i mie  $\frac{2}{3}$  a c 94 perp. 702 car. 2." Translation: "on 22 August 1437 from Nofrio da Chalzi for the amount of the net profit of the  $\frac{2}{3}$  of the 49 cantars and 16 rotoli of copper opposite, which he reported having been weighed net in Syracuse and Messina as 27 cantars and 24 rotoli sold either at 16 $\frac{3}{4}$  or 17 or 15 $\frac{1}{2}$  florins a cantar. He reported it for a total amount of 456 florins, 2 taris, 2 grains, equaling, at 5 florins the ounce, 91 ounces, 7 taris, 3 grains, once expenses are deduced first for nolis, 2 ounces, 10 taris, and for the cost of weighing, storing, and shipping from Syracuse to Messina, and for other gratuities 3 ounces, 12 taris, 5 grains, and for brokerage 14 taris, and for customs in Syracuse at 2%, 25 taris, and for customs in Messina at 3% on what was sold in Messina, 1 ounce, 12 taris, 4 grains and for (his) commission on all that at 2%, 1 ounce, 23 taris, 8 grains, these expenses totaling 10 ounces, 6 taris, 17 grains, leaves net 81 ounces, 0 taris, 3 grains, valued at 13 perperi to the ounce, which make my  $\frac{2}{3}$  at c. 94, 702 perperi, 2 carats."

<sup>22</sup>The tarì had been of course, as is well known, an actual coin of 1.06 g and 16 $\frac{1}{2}$  carats fine. After "it ceased to be struck as a definite weight unit . . . the word was used in two senses, as a tarì weight in 16 $\frac{1}{2}$  carat gold or as a money of account of corresponding value": P. Grierson and L. Travaini, *Medieval European Coinage*, vol. 14, *South Italy* (Cambridge, 1998), 473 (hereafter MEC). According to P. Spufford (personal communication, 10 July 1999), "the fifteenth-century florin of account in Sicily possibly derived from a fourteenth-century state of affairs when the gold florin/ducat of the north Italian cities had for long actually hovered around 6 tarì (12 *pierreali* or *carlini*)."

<sup>23</sup>Grierson and Travaini, MEC 14:435, 463.

The florin mentioned here is a florin of account worth  $\frac{1}{5}$  of the ounce and hence 6 tarì, which is also known from other sources.<sup>24</sup>

#### *Pounds and Shillings of Majorca*

In 1438 Badoer participated in a “venture to Majorca,”<sup>25</sup> sometimes also called in the final account “viazo de Chatelogna.”<sup>26</sup> Among the sums owed to him by Marcho Balanzan (probably the captain or the merchant to whom the venture was entrusted) were: “60 pounds equaling 47 ducats, at 26 [i.e., soldi] the ducat; of which 7 ducats are due to me for the 3 carats of mine invested in the company, that is, at 3 perperi and 3 carats a ducat, 22 perperi and 1 carat” (“livre 60 che val a 26 [soldi] el duchato, duc. 47, tochamene per i mie charati 3 che partizipo in la chonpagnia duc. 7, che val a perp. 3 car. 3 el duchato perp. 22 car. 1”).<sup>27</sup>

These soldi cannot be considered shillings of Barcelona for two reasons: first, the text mentions 88 “livre de Maioricha,” owed to Badoer by Balanzan; second, the rate of 26 soldi (s.) to the ducat is much higher than those collected from other sources in Peter Spufford’s *Handbook of Medieval Exchange* for that period (ca. 15) and is even higher than anything quoted in his table on p. 145.

Peter Spufford and Miguel Crusafont have been kind enough to inform me that, although Majorca belonged with Catalonia and Aragon to the same kingdom, it had its own coinage and its own money of account. “Unfortunately,” writes Spufford:

I gathered no rates for the money of Majorca in the fifteenth century at all, either for the *Handbook* (p. 153) or since. I am, however, quite happy to believe in a rate of around 26 soldi of Majorca to the ducat in 1438. In the mid-fourteenth century it was already a much weaker currency than that of Barcelona (1 pound of Barcelona = 30 soldi of Majorca). I do not think that either Barcelona or Majorca suffered major changes to their coinage between Pedro IV (1336–87) and Alfonso V (1396–1458), so that I would expect the money of account in Majorca to be still much weaker than that in Barcelona, for which I collected the references in my *Handbook*, p. 145. There is also some confusion or inconsistency in the rates I collected for Florentine florins and Venetian ducats in money of Barcelona, which I have not resolved. Why rates like 17 soldi–18 soldi and rates like 14 soldi–15 soldi? The ducat at 26 soldi of Majorca would fit with 17 to 18 soldi of Barcelona if the 1 pound of Barcelona = 30 soldi of Majorca relationship was still even approximately true.

The lower value of the Majorcan sous is confirmed on numismatic grounds by Crusafont who points out that ever since its inception in 1300 the Majorcan denier (d.) had a lower intrinsic value than the Barcelonian one: 22 sous at 2.75 deniers fine in a mark in Majorca in contrast to 18 sous at 3 d. fine in Barcelona. Moreover, this value was decreased in 1400 to 24 sous at 1½ d. fine, a situation that still obtained in Badoer’s time. There remains, however, a small problem concerning Badoer’s calculation since his equa-

<sup>24</sup>See C. Trasselli, *Note per la storia dei banchi in Sicilia del sec. XI. I. Zecche e monete* (Palermo, 1959), 34, quoted by P. Spufford, *Handbook of Medieval Exchange* (London, 1986), 66.

<sup>25</sup>July 1438, c. 220, p. 442, line 10; c. 373, p. 749, *passim*; c. 374, p. 750, *passim*.

<sup>26</sup>C. 374, p. 751, line 21; see also c. 218, p. 519, lines 9–10 (1439): “per el viazo de Maioricha, per l’amontar de  $\frac{3}{10}$  che son partizipo in una chonpagnia che avemo al viazo dito chon.” Badoer’s participation amounted to 6,103 hyperpyra. “Viazo de Chatelogna”: c. 374, p. 750, line 11.

<sup>27</sup>C. 374, p. 750, lines 20–23.

tion of “47 ducats at 27 soldi [i.e., 1222 soldi] = 60 pounds” gives a pound of a little more than 20 soldi ( $\pm 20$  s.  $\frac{1}{3}$  but not exactly 20 s. 4 d.), which may point to the need for inquiring into and checking Badoer's accounting on the abacus, since, on checking the manuscript, there is apparently no mistake in Bertelè's reading.<sup>28</sup>

ACTUAL COINS USED BY BADOER OR HIS CORRESPONDENTS  
AND THEIR RATES OF EXCHANGE

In the cash accounts (*cassa*)<sup>29</sup> kept in Badoer's ledger the various currencies he dealt with in cash (*chontadi*) appear frequently. Actual perperi *contanti/chontadi* are unsurprisingly the most frequent, but on 30 October 1436, for example, we also note 5 Venetian ducats (*chontadi*) loaned by Badoer to a merchant (Alexander Zen) going on business to Bursa or 1,300 Turkish aspers drawn by Badoer on his bank for the same Bursa venture and, on another occasion, 3 Turkish ducats loaned to Antonio da Negroponte, a merchant from Trebizond, associated with Badoer in the venture to Simisso and Trebizond.<sup>30</sup> In what follows I begin with these three main currencies—Byzantine, Venetian, and Turkish—and consider the remaining ones in more or less decreasing order of importance.

*Byzantine*

It should be remembered that it is due to Badoer that Bertelè was able to establish the relative values of the existing Byzantine coins of the time,<sup>31</sup> previously unknown.<sup>32</sup> As volume 5 of the Dumbarton Oaks coin catalogue provides the state of the art, the following brief outline will suffice here.

The perpero (a money of account since the disappearance of gold issues after 1353) was equated to 2 big silver coins of ca. 7.2 g.<sup>33</sup> The accounts show in fact that they were some 7.1 g heavy, according to a 317 g pound (e.g., c. 88, p. 179, line 3, where 616 *perperi grievi* “weigh 27 pounds and 9 ounces”). This weight for heavier perperi agrees with the modal weight of 7.09 g of the 149 John VIII specimens preserved at Dumbarton Oaks.<sup>34</sup> This big silver coin was named *stavraton* (see fig. p. 245), as Cutler already discovered in 1964 from his reading of the *Libro*.<sup>35</sup> However, even when Badoer mentions a number of *perperi chontadi* or *stavrati*, it does not necessarily mean the same number of coins but the

<sup>28</sup>Or, as P. Spufford puts it: “47 ducati at 25 s. 6 d. would give something like 60 pounds (59 li. 18 s. 6 d.), or at 26 s. would, as you point out, give 61 li. 2 s. I cannot believe, any more than you can, in a livre of circa 20 s. 4 d.”

<sup>29</sup>See Lane and Mueller, *Money*, 423–24.

<sup>30</sup>For details see c. 16, p. 33, lines 9, 20–23 and c. 44, p. 88, lines 27–28, c. 48, pp. 96–97.

<sup>31</sup>Bertelè, “Liperpero,” 70–89.

<sup>32</sup>See W. Wroth, *Catalogue of the Imperial Byzantine Coins in the British Museum*, vol. 1 (London, 1908) where coins are only classified according to the metal of their alloy. The silver issues of Manuel II are said (p. lxxii) to have consisted of “three or four denominations, . . . the highest of which was intended to weigh about 136 grains [8.8 grams].”

<sup>33</sup>“8.8 g.” diminishing to “7.20 g” under John VIII (Bertelè, “Liperpero,” 79, 84).

<sup>34</sup>Grierson, *DOC* 5.1:230.

<sup>35</sup>Cutler, “Stavraton,” 239–40. Commenting on Cutler's article, in the letter to Adelson quoted above (note 4), Bertelè wrote: “Cutler (che ritengo sia un giovane) ha apprezzato al suo giusto valore il Libro . . . , e ciò mi fa molto piacere mentre fa onore a lui. Con molto acume, ha trovato il nome ‘staurato’ di cui ha compreso l'interesse.”

corresponding value represented by actual silver coins of the series, whether the biggest ones, the intermediate ones (half-stavraton, see fig., p. 00), or the smaller ones.<sup>36</sup> Different entries, notably in the cash account, show the latter to have been definitely called *duc(h)atelli* and to have been reckoned at 1 carat and a half, that is,  $\frac{1}{16}$  hyperpyron (eighth-stavraton, see fig., p. 00).

*Duchatelli* are mentioned only in transactions involving fees paid to porters carrying or transporting goods to and from the dockyards and Badoer's merchant house,<sup>37</sup> for example, one duchatello to carry a bundle (*faso*) of tin bars, 5 duchatelli for a bale of Flemish cloth carried on a cart (*chareta*).<sup>38</sup>

Finally, Badoer mentions a small copper denomination called *tornexe*, which he reckons at  $\frac{1}{8}$  carat, that is, 192 of them to the hyperpyron. *Tornesi* (copper coins of ca. 2–3 g) (fig., p. 00) also appear as fees paid for transporting goods, whether bundles of steel ("azali fasi") or tin ("stagni fasi"), and Lefort's calculations show the same tariff to have applied to every parcel (*colo*) whatever its type, whether *fascio* (bundle), *barile* (barrel), *cassa* (chest, coffer), *involto* (wrapping), or *sacco* (bag).<sup>39</sup> The smallest coin of the time (ca. 0.8 g), which was probably called *follaro* in Badoer's time, is not even worth enough to be mentioned as a tip, and Badoer uses it only as an equivalent of similar minute copper coins from Wallachia being exported to Alexandria as bullion (see below, p. 227).

The *perperi per cassa chontadi* vary from a handful of coins for settling an account,<sup>40</sup> paying the salary of an assistant (e.g., "6 perperi 10 al mexe"),<sup>41</sup> and making small purchases (e.g., 16 perperi of wax bought from an Armenian) to more important ones (233 perperi for tin bundles).<sup>42</sup> The entries also mention *perperi* or *stavrati grievi*, heavy perperi. The phrase does not refer to the older heavy perperi of John V, Andronikos IV, or the early coins of Manuel II of some 8.2 g before the 1394/95 decrease of the weight of the silver higher denomination to ca. 7.1 g. Since their overvaluation is in the range of 1.25 percent to 2.6 percent (instead of the 15 percent difference between pre- and post-1395 coins), they are more likely to be, as Hendy and Lane and Mueller assume, specimens culled out and valued as metal at 22 perperi 15 carats the pound. Badoer usually deposited them into his bank with the order to sell them to the mint (to Critopulo de la zeca).<sup>43</sup> This means that bullion must have been scarce and that the mint was "overbuying" it—a well-known practice in medieval and modern monetary history.<sup>44</sup>

*Exchange Rate of the Hyperpyron in Venetian Ducats* Leaving aside the bills of exchange, used either as a means of payment or simply traded for themselves, which played a great

<sup>36</sup> Lane and Mueller, *Money*, 423.

<sup>37</sup> C. 8, p. 16, line 5; "Veli crespi. cassa la . . . e per bastaxi per mandar a caxa duchateli 4 val car. 6." See the detailed study by J. Lefort, "Le coût des transports à Constantinople, portefaix et bateliers au XVe siècle," in *Eupsychia, Mélanges offerts à H. Ahrweiler*, vol. 2 (Paris, 1998), 413–25.

<sup>38</sup> C. 9, p. 18, line 21.

<sup>39</sup> C. 8, p. 16, line 17 (October 1436): "Stagni fasi. 12 . . . e per mandar da caxa al pexo a tornexi 6 per cholo (val) car. 9." If  $6 \times 12$  tornese = 9 carats, 1 tornese =  $1/8$  carat =  $1/192$  hyperpyron.

<sup>40</sup> E.g., "per resto de un conto"; c. 16, p. 32, lines 20, 27.

<sup>41</sup> Salary of Zorzi Morexini, Badoer's servant (*fameio*) in 1437: c. 40, p. 81, line 26; wax: c. 16, p. 32, line 20.

<sup>42</sup> C. 16, *passim*.

<sup>43</sup> C. 101, p. 204, line 25; c. 180, p. 362, line 30; c. 186, p. 375, line 19, etc. See Hendy, *Studies*, 538; Lane and Mueller, *Money*, 423.

<sup>44</sup> E.g., in 18th-century France; see Ch. Morrisson et al., *Or du Brésil, monnaie et croissance en France au XVIIIe siècle* (Paris, 1999), 66–67.

role in Badoer's activities (i.e., merchant's exchange), I will focus on the rate at which Badoer valued or exchanged one currency for the other in Constantinople in manual exchange. Several entries regarding "ducati d'oro dusi chontadi" ("gold ducats carried in cash") or "in chassa chontadi," or simply *chontadi* make it clear that the usual rate varied around 3 perperi (p.) 6 carats (car.) to a ducat. In 1436 on Badoer's arrival in Constantinople with the galleys in September, it is 3 p. 6 car.,<sup>45</sup> while when settling his accounts with his brother Jeronimo in Venice, the ducat is always reckoned at par at 3 perperi. This is a classic example of the *cambisti* rule and confirms R. de Roover's statement about the exchange rate being higher on the market place "quoting certain" (Venice) to the other (Constantinople).<sup>46</sup> The range of rates assembled by Bertelè from Badoer's entries spreads from 2 perperi 22 carats to 3 perperi 10 carats,<sup>47</sup> and the variation is mostly explained by the context of the transaction involved, whether implying credit or not.

#### *Venetian Ducats*

The gold ducat (fig., p. 245) weighed slightly more than the florin (3.56 g as against 3.536 g) until the latter was aligned on its standard in 1422. Its fineness was intended to be "tam bona et fina . . . vel melior ut est florenus," as indeed measurements of the ducats in the Grierson collection at ± 99 percent have proved.<sup>48</sup> It dominated the circulation of the eastern Mediterranean, and it is no surprise that we find it on many occasions in the *Libro*, used not only for transactions with Venice but also—like dollars nowadays in Eastern Europe—as cash for travel. It is the only actual Venetian coin appearing in Badoer's accounts except for the mention of the few *soldi* found in the purse of his *zovene* Antonio Bragadin, who died a few months after he had arrived in Constantinople with Badoer. The scrupulous bookkeeper noted that there "were found in his purse two gold ducats and two (Constantinople) perperi and 8 soldi of Venice" that he evaluated altogether at 8 hyperpyra and 15 carats" ("trovado in la so borssa duc. 2 d'oro e perp. 2 e soldi 8 da Veniexia mete valer in tuto c. 16 perp. 8 car. 15."<sup>49</sup>

#### *Turkish (Ducats and Aspers)*

The *ducati turchi*, first mentioned in Uzzano in 1425, also appear in other mid-fifteenth century texts: in 1428 their circulation is forbidden in Genoa and its district, and they are known to have been used later in Moldavia, from 1449 to 1465 under the name of *zlotul turcesc*.<sup>50</sup> A document from Arezzo from the 1430s mentions "florins or

<sup>45</sup>E.g., c. 6, p. 13, line 5; c. 3, p. 6, line 10; c. 14, p. 28, lines 5–7.

<sup>46</sup>R. C. Mueller, *The Venetian Money Market: Banks, Panics and the Public Debt, 1200–1500* (Baltimore, Md., 1997), 301, 316–17. A place "giving certain" rates the local unit (here the ducat) in terms of foreign currency (here the hyperpyron), see R. De Roover, "Le marché monétaire au Moyen Age et au début des temps modernes," *Revue historique* 495 (1970): 17.

<sup>47</sup>Bertelè, "Moneta veneziana," 28–29, 54–58.

<sup>48</sup>P. Grierson, "The Weight of the Gold Florin in the Fifteenth Century," *Quaderni ticinesi: Numismatica e Antichità classiche* 10 (1981): 421–31.

<sup>49</sup>C. 26, p. 53, lines 1–2.

<sup>50</sup>F. Babinger, "Südosteuropäische Handelsmünzen am Ausgang des Mittelalters," *Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte* 44 (1957): 352–58, repr. in idem, *Aufsätze und Abhandlungen zur Geschichte Südosteuropas und der Levant*, vol. 2 (Munich, 1966), 190–95.

ducats from Turkey or other places (or from Altoluogo/Ephesos?) and mentioned along with “those struck in Spain (?) with the Venetian type” (“fiorini turchi o ducati turchi (e altro luogo) [Altoluogo?], e quali si batterono in Spagnia [che] anno stampa di Vinesgia”). They are difficult to distinguish according to the same sources: “experience or a good eye is needed to recognize them, and each of them is less by one soldo a fiorino” (“bisogna praticha [o bisogna buono occhio] a conoscerli; sono peggio l’uno soldi uno a fiorino”).<sup>51</sup> The Ottomans struck gold coins with their own imprint only in 1477/78, when an *altun* of the same value as the Venetian ducat bears a proud Arabic inscription celebrating Mehmed II’s victories: “Striker of the Radiant [i.e., gold coins], Master of Glory and Victory / on Land and Sea.”<sup>52</sup> The previous imitative Turkish ducats remain to be identified on the basis of coins with reliable provenance coupled with numismatic and metallurgical analyses.

But the later evidence of the Genoese Iacopo de Promontorio about the farming out in 1475 of the minting of “ducati d’oro in stampa veneziana,” for 3,000 ducats a year<sup>53</sup> apparently indicates that the sultan himself (and not counterfeiters) may have been responsible for the minting of these imitations.<sup>54</sup> Badoer first mentions them in January 1437 when dealing in Constantinople with a changer called Todaro Franchopulo. They are rated at 2 perperi 1½ car. to the ducat, or 2 perperi 1 car. and 2 tornesi or 2 perperi 10 tornesi, that is, reckoning with the perpero value of ca. 3 to a ducat,<sup>55</sup> one and a half Turkish ducats to the Venetian one = 2/3 of it. These slightly varying valuations probably depended on prior testing of the pieces; and Badoer apparently on prior testing of the pieces; and Badoer apparently sent part of the 251 coins assembled<sup>56</sup> as bullion in the

<sup>51</sup> The document from Arezzo was published by U. Pasqui, “Monete d’oro e d’argento correnti in Firenze nel sec. XV,” *RIN* 30 (1917): 79 and is quoted by F. Babinger, “Zur Frage der osmanischen Goldprägungen im 15. Jahrhundert unter Murâd II. und Mehmed II.,” *Südost-Forschungen* 15 (1956): 550–53, repr. in *idem, Aufsätze*, 2:110–12, esp. 112. Cf. Grierson, *Later Medieval Numismatics*, XII, 92.

<sup>52</sup> F. Babinger, “Contraffazioni ottomane dello zecchino veneziano nel XV secolo,” *AnnIstNum* 3 (1956): 83–99, repr. in *idem, Aufsätze*, 2:113–26, esp. 121ff and 123ff. The translation of the legend is that of M. Bates in *Islamic Coins*, American Numismatic Society (New York, 1963), no. 31, with an illustration of the coin. Michael Bates has been kind enough to comment on this legend and the differences between his and Babinger’s translation (“il coniatore dell’oro/possessore della potenza e della vittoria / per terra e per mare”) in a letter, 26 May 1999: “it is pretty much the same as the Italian, except that the word ‘gold’ is not used. The word *nadir* for radiant or glorious is used, I believe, strictly for the ‘visual rhyme’ with *nasr* = victory. It is not just another word for gold—it’s the word ‘striker’ that gives away the intention.”

<sup>53</sup> Babinger, “Contraffazioni,” 125.

<sup>54</sup> M. Bates comments on this point in the letter cited above: “The ‘responsibility’ is of course diffuse. I had understood that some of the other ‘Frankish’ coins of the ‘Turks’ (not the Ottomans but the Beyliks) were in fact struck by Franks, presumably Italians, who had come to the ruler to propose the operation against a share of the profits for the ruler (see my introduction to the Islamic coins in T. Buttrey et al., *Greek, Roman and Islamic Coins from Sardis* [Cambridge, Mass., 1981], 228). So I’m not surprised, but very interested, to learn that the Ottoman sultan also profited from such an operation. Whether he actively arranged it, or merely profited from the activities of others, would be an unanswerable question, I suppose.”

L. Travaini recalls an earlier example of Venetian ducats copied by Alfonso I the Magnanimous for his expedition to Naples in 1442, the production of which took place in a private house in Messina and not in the mint, L. Travaini, “Sedi di zecca nell’Italia medievale” in *I Luoghi della Moneta. Le Sedi delle Zecche dall’Antichità all’età moderne* (Milan, 2001), 69–85, p. 79.

<sup>55</sup> Account of Chaloiani Sufiano banchier, credit (c. 3, p. 7, lines 12–17) various exchange rates on 16 September 1436 for different sums of “duc. turchi per cassa ch’el dè chontadi per mi a Todaro Franchopulo a . . . bancharoto” (money changer).

<sup>56</sup> This parcel of 251 ducats included: 111 duc (c. 3, p. 7, lines 12–15) and 140 duc (ibid., line 20) previously given by the banchier Chaloiani to Badoer.

shipment to Trebizond (March to December 1437). The *Libro* details the process of their consignment in its account of the Trebizond venture: “200 Turkish ducats in weight boarded on the ship of captain Jannis Tepeftos of Constantinople in a purse marked and sealed with my imprint, which I entrusted to the aforesaid captain in my house, in presence of (the names of the witnesses follow)” (“duc. 200 turchi de pexo chargadi su la nave patron Jani Tepefto de Costantinopoli in gropo uno signado e bolato de mio segno, el qual gropo chonsigni al dito patron in caxa mia presenti . . . ”).<sup>57</sup> They cost 414 perperi and were sold in Trebizond for 433 perperi 20 carats, that is, at 19 perperi 20 carats or 4.8 percent profit.<sup>58</sup>

That Turkish ducats were current in Simisso (Amisos/Samsun)<sup>59</sup> is clear from the fact that Badoer lent three of them to his Trebizond agent Antonio da Negroponte on this occasion,<sup>60</sup> whereas, surprisingly, the account of the Bursa venture includes only proper Venetian ducats, five coins being loaned to the merchant going there, although one would expect Turkish ducats to have been current in the Ottoman capital.

Turkish aspers or *akçes* were struck for the first time in Bursa in 1327, and then in other Ottoman mints (Amasya, Edirne, Ayasoluk, Serres, etc.), at ca. 1.06 g and some 90 percent to 95 percent fineness (fig., p. 245).<sup>61</sup> They appear as the most current and widely used denomination in the pepper venture of Bursa (for a total of 19,000 asperi: c. 33, p. 66, line 17, in October–November 1436) and in subsequent affairs carried over by Badoer together with his Italian correspondent, Christofal Bonifatio, in Bursa (between 1437 and May–August 1438) where, for instance, 12 *casete* of *veli* were sold for 7,355 aspers.<sup>62</sup> They also appear in the Edirne venture. Obviously they are used to carry on all kinds of transactions including important ones.

They are valued at different rates varying around 11 to the perpero, of which a few examples are given below:

- 1436, 5 December: “a asp. 11 t°4 a perparo” (c. 29, p. 59, line 19)
- 1437, 13 February: “a asp. 11 t°2 a perparo” (c. 29, p. 59, line 23)
- 1437, 24 July: asp. 5100 “achatadi a asp. 11 a perparo” (c. 92, p. 186, line 2)
- 1437, 30 April: “a asp. 11 t°1½ a perparo” (c. 55, p. 110, lines 8–10)<sup>63</sup>
- 1437, 30 April and 20 September: in the account of the venture to Adrianople different entries reckon the asper at “perperi 9 el c°” or “el zentener di asperi,” that is, ca. 11 asp 1½ tornese (c. 43, p. 87, lines 20–21, 25–26)
- 1438, 20 October: “a asp. 10½ e tornesi 2 a perparo” (c. 285, p. 573, line 2: for the venture to Rodosto)

<sup>57</sup>C. 51, p. 102, lines 8–12.

<sup>58</sup>C. 51, p. 103, lines 8–12.

<sup>59</sup>Simisso/Samsun had been in Turkish hands since the early 15th century, the Genoese Simisso having been conquered by Mehmed I in 1418 and the part of the city that belonged to the Djandarid dynasty in 1421; see N. Vatin, in *Histoire de l'empire ottoman*, ed. R. Mantran (Paris, 1989), 60.

<sup>60</sup>C. 44, p. 88, line 28.

<sup>61</sup>DOC 5.1:38 with ref.: T. Bertelè and C. Morrisson, *Numismatique byzantine* (Wetteren, 1978), 89 (fineness).

<sup>62</sup>C. 21, p. 123, lines 3–4.

<sup>63</sup>For a bill of 1,200 aspers drawn from Gallipoli on Badoer and entered in the account of the venture to this city: “a di 30 april per ser Charlo Chapelo dal bancho per asp. 1200 turchi ch'el dè per mio nome a ser Franzesco di Drapieri per una letera de chanbio che me mandò a pagar Bortolamio da Modena da Garipoli per altratanti asperi ch'el rezevè in Garipoi da Jeronimo da . . . , fator del dito ser Franzesco, val a asp. 11 t° 1½. a perparo.”

1438, 28 December: “a asp. 10½ a perparo” (c. 301, p. 604, line 15: 60 aspers spent for a horse cover bought in Bursa)

1439, 22 January: “a asp. 10½ e tornexi 2 a perparo” (c. 289, p. 580, line 27)

1439, 1 June: “a raxon de asp. 10⅔ a perparo” (c. 315 p. 632, line 37: for the freight charges of goods transported from Thessalonike)

Badoer provides 15 Turkish aspers in Constantinople on 30 January 1439 to one of his correspondents from Bursa “per cassa chontadi” valued at 4 perperi, a rate of 11¼ aspers, that is, 11 aspers 3 tornesi to the perpero, which cannot have applied to the small Byzantine asper.<sup>64</sup> There is also one instance of *asperi grievi*,<sup>65</sup> to which I will return later (below, p. 236).

### *Trebizond Aspers*

The Trapezuntine aspers (fig., p. 245) were first struck after the Mongol incursions in 1240 by Manuel I Komnenos (1238–63) at a weight corresponding to that of the dirham and of a high purity. They were much debased in the fifteenth century when they weighed ca. 1 g at 51 percent silver.<sup>66</sup>

They appear in the different ventures to Trebizond at rates varying between 33⅓ and 40 aspers to the perpero, of which a few examples follow:

1436: “a asp. 33⅓ a perparo” (c. 7, p. 15, lines 14 and 38: (in settling account with his brother Jeronimo Badoer)

1437, 18 December: “a asp. 40 a perp.” (c. 51, p. 102, line 32: (bill of exchange drawn in Trebizond by Griguol Contarini)

1437, 5 December to 1438, 19 April: “a asp. 36 a perparo” (c. 153, p. 308, lines 4–13: in the account of Griguol Contarini)

1438, 22 January: “a asp. 36 a perparo” (c. 166, p. 334, line 22)

1438, 24 January: “asp. de Trabexonda che valiano a assp. 40 a perparo” (c. 173, p. 348, line 7)<sup>67</sup>

1438: “perp 75 raxondo [sic] asp. 36 a perparo” (c. 173, p. 348, line 13)<sup>68</sup>

1438, 8 December: “val. a asp. 36 a perparo” (c. 288, p. 578, line 9)

Reckoning with the actual weight of the perpero at 14.2 g, the exchange rates give to the Trapezuntine asper a 0.39–0.42 g fine weight inferior to the ca. 0.51 g measured in real coins. Based on the earlier weight of the perpero in the fourteenth century at 16.40 g, it is 0.49 g, not far from par.<sup>69</sup>

<sup>64</sup>C. 227, p. 456, line 22.

<sup>65</sup>C. 88, p. 179, lines 19–20, unnoticed by previous commentators except for A. M. de Guadan, “Las equivalencias monetarias de Mediterráneo Oriental en el periodo 1436–1440,” *Acta Numismatica* 3 (1973): 149–61, esp. 156.

<sup>66</sup>A. A. Gordus and D. M. Metcalf, “Non-Destructive Chemical Analysis of the Byzantine Silver Coinage of Trebizond,” *Αρχ. Πόντ.* 33 (1975–76): 28–35. These give 51.4% silver on average in the six coins of Alexios IV (1419–29) analyzed.

<sup>67</sup>Amount due for the amount of 13,762 aspers paid in Trebizond by Antonio de Negroponte (“che abita in Trebizonda”; c. 166, p. 334, line 20) to Badoer’s correspondent, Griguol Contarini.

<sup>68</sup>Settlement on 2 January 1439 of the contract/association “per resto de raxon fata d’accordo” with Antonio de Negroponte registered in the books of the local *baile* on 2 January 1437.

<sup>69</sup>Guadan (“las equivalencias,” 156) reckons from the 17.60 g of Bertelè (8.8 g × 2) and gets an asper of 0.52 g. He overlooked the fact that the 40 aspers rate was an exceptional one.

*Genoese and Related Currencies (Pera; Sommo and Aspers in Caffa, Bezants of Tana, Aspers of Simisso)*

*Ducats of Pera* Among the 200 “Turkish ducats” mentioned earlier as being put into a sealed purse in front of witnesses, and which presumably had been previously tested or checked, seven were found defective when sold in Trebizond by Badoer’s correspondent. These appeared to be “duchati de Pera e duchati scarsi.”<sup>70</sup> Due to this deficiency, they were rated at 71 [Trebizond] aspers to the ducat instead of 80 for the Turkish ones, that is, 11 percent less. This would result in a Genoese ducat from Pera worth a little less than two-thirds of the Venetian one. Their current use in Pera is shown by two other entries referring to Badoer’s paying “per cassa” 4 ducats worth only 2 perperi each to a carpenter (*marangon*) residing in Pera.<sup>71</sup>

Ducats with a letter P in the field were attributed by Sp. Lambros to Pera and were clearly identified as imitative issues by the legends in the name of Filippo-Maria Visconti (duke of Milan and lord of Genoa, 1421–36) or Tommaso di Campofregoso (doge of Genoa, 1436–43, fig., p. 245), the latter being half the weight of a normal ducat.<sup>72</sup> They cannot have been the imitations that led Badoer astray. An updated and enlarged version of the Ives-Grierson introduction on the imitations of the ducat is clearly a desideratum. A hoard of some thousand of them deposited ca. 1457 appeared on the market in 1989: alongside numerous “Levantine” imitations of the first half of the fifteenth century, including ones of the Genoese in Chios, the Gattilusi and the Hospitallers in Rhodes, and a handful of authentic Venetian ones, it contained three hitherto unknown coins of Filippo-Maria Visconti with DUX MEDOLANI-DN.IANUE and GENUIT.ME.IANUA.CAFFAM on the reverse dating to 1421–36.<sup>73</sup>

*Caffa Sommo and Aspers* Badoer maintained frequent relations with Caffa, and his entries give the exchange rate of the *sommo*. The sommo was a silver ingot of ca. 200–205 g

<sup>70</sup>Cf. “eschars” in Old French indicating a defect in the weight or fineness of the coin. C. 51, p. 103, lines 9–12: “The . . . [Trebizond] venture [of 1437] will receive on 5 December from Messer Gregorio Contarini, according to the account received through the galleys commanded by Messer Alvise Contarini he assigns me, for the net profit on the 200 Turkish ducats he declares to have sold at 80 aspers each, 197 ducats and 7 ducats at 71 aspers because they were ducats of Pera and underweight ducats, which makes a total of 15,936 aspers, minus his commission at 1% and the Commune tax at 1% [which is] 318 aspers, leaves 15,618 aspers, which I enter valued at 36 aspers a perpero, 433 perperi, 20 carats” (“Viazo a l’inchontro diè aver a di 5 dizembre per ser Griguol Chontarini segondo che per un chonto rezevudo per la galia patron ser Aluvixe Chontarini el me asigna per il trato neto de duc. 200 turchi ch’el mete aver vendudo, a asp. 80 l’uno duc. 197 [invece di 193] e duc. 7 a asp. 71, perchè ne fo duchati de Pera e duchati scarsi, monta in tutto asp. 15936, bate per sua provixion a j per c°. e per dreto de Chomun, a 1 per c°., asp. 318, resta asp. 15618, che meto valia a asp. 36 a perparo—c. 153 perp. 433 car. 20”).

<sup>71</sup>C. 76, p. 154, line 7 and p. 155, line 9; c. 186, p. 374, line 14. Cf. Babinger, “Contraffazioni,” 123.

<sup>72</sup>P. Lambros, *Anekdoti nomismata kopenta en Peran*, (Athens, 1872) (I have not seen this rare book, which is not owned by the Bibliothèque Nationale or the Dumbarton Oaks library); quoted by G. Schlumberger, *Numismatique de l’Orient Latin* (Paris, 1878), 453, pl. xvii, 21–22; H. E. Ives, *The Venetian Gold Ducat and Its Imitations*, ed. P. Grierson (New York, 1954), 24; G. Lunardi, *Le monete delle colonie genovesi* (Genoa, 1980), 23–28: 3.51 g for Filippo Maria Visconti, 1.80 g and 1.86 g for those of Campofregoso.

<sup>73</sup>G. Giacosa, “Il ducato d’oro di Caffa,” *Annotazioni numismatiche* 29 (1998): 659–63: 3 specimens are known: Finarte, May 1986, no. 786, and two others wrongly identified: one, similar to the preceding, in Classical Numismatic Group auction, May 1995, no. 425, and a variety in Auctiones 11, 30.9–1.10.1980, no. 755.

and secondarily a money of account.<sup>74</sup> Badoer uses it to rate the bills he sent to his correspondent in Caffa on his own account or for the account of others for the purchase of slaves, wax, furs, or other staples.<sup>75</sup> The rate varies between 9 perperi 6 carats and 10 perperi 9 carats to the sommo, slightly less than in the early fifteenth century (14–11 perperi<sup>76</sup>). In spite of its relatively stable metal content, the hyperpyron is still then declining. There is apparently no correlation between the rate and the “direction” of the bill, whether drawn on Constantinople or on Caffa, nor the means of its transportation (“per la nave,” “per via de Monchastro,” etc.).

In Caffa the sommo is reckoned at 20½ aspers,<sup>77</sup> the asper being the actual coin in use there. From the mid-thirteenth century Caffa had been using the Tatar asper (*aspri baricati*) then valued at 112 to the sommo, and only 200 or 237 in 1409–10.<sup>78</sup> The Genoese finally resorted to striking bilingual aspers of their own weighing ca. 0.56–1.00 g with the gate of Genoa (*ianua*) on one side and the Tatar *tamga* on the other (fig., p. 245).<sup>79</sup> In settling his accounts with his local correspondent, Andrea da Chale, Badoer reckons 20 aspers to the perpero,<sup>80</sup> which makes ca. 207 aspers to the sommo. Reckoning with the actual weight of the perpero at 14.2 g and its fineness of some 90 percent under John VIII, the exchange rates give a 0.64 g fine weight, or 0.73 g when based on the earlier weight of the perpero in the fourteenth century at 16.40 g. This remains to be compared with preserved aspers, for which I am aware of no metrological study.

*Aspers of Simisso* In the account of the venture to Simisso and Trebizond (“de Simiso e Trabexondo”) appear “1165 asperi de Simixo” rated at 19 to the perparo and 36 to the Turkish ducat.<sup>81</sup> Their rate of exchange is close to that of the Caffa asper ( $\pm$  20). Could they be previous local Genoese aspers going back to the time of Genoese establishment there and still current,<sup>82</sup> although such aspers have not yet been identified by numisma-

<sup>74</sup> Hendy, *Studies*, 547–51 (detailed analysis of Italian texts giving various standards “which seem to fall”). Lane and Mueller, *Money*, 164 n. 10, mention a possible weight of 316.75 g without indicating the source.

<sup>75</sup> See the bill of 622 perperi and 15 carats plus Badoer’s commission (*provixion*) at 1%, totaling 628 perperi, 17 carats on c. 74 and c. 75, pp. 150 and 152. See also pp. 354–55 (“Viazo de Chafa”) and pp. 422–23 (account of ser Andrea da Chale), as well as pp. 493, 494 (for letters drawn on Badoer from Caffa).

<sup>76</sup> 14 perperi in 1401, 13 perperi, 6 carats in 1409–10 (M. Balard, *La Romanie génoise* [Rome, 1978], 663); 11 perperi, 18 carats in 1426 (N. Iorga, “Notes et extraits pour servir à l’histoire des Croisades au XVe siècle: Comptes des colonies génoises de Caffa, de Péra et de Famagouste,” *ROL* 4 [1896]: 59).

<sup>77</sup> C. 210, p. 422, line 6.

<sup>78</sup> Balard, *Romanie*, 659–62.

<sup>79</sup> According to the weights of specimens in the Rome Museum given by Lunardi, *Monete*, 103–7. However, Lunardi (p. 35) considers that the Genoese must have been striking imitations of the Tatar asper prior to 1433.

<sup>80</sup> See c. 65, p. 131, lines 6–7, account *utel e danno* “per eror fato in so chonto,” etc. The same exchange rate applies in the *Ternaria* document of ca. 1268, published and commented on by Lane and Mueller, *Money*, 627.

<sup>81</sup> “val a asp. 19 a perparo” (c. 44, p. 88, line 30) and “asp. 36 el duchato turcho” (c. 44, p. 89, line 8).

<sup>82</sup> Balard, *Romanie*, 668 mentions—without quoting any source—documents pointing to “petites monnaies d’argent frappées sans doute par des ateliers locaux et dont la valeur n’est guère brillante,” an asper of Simisso containing only 0.80 g fine silver in 1386. This rate would make the asper in Badoer’s entry 0.68 g fine for a 14.2 g and 90% fine perpero. A. M. de Guadan, “Algunos casos de monedas medievales del Mediterráneo Oriental, sólo conocidas por fuentes literarias,” *Acta Numismatica* 14 (1984): 169–89, esp. 170, assumes that the text indicates that the Genoese were holding this fortress or *comptoir* at least between 1437 and 1440, a hypothesis that he bases on T. Bertelè, “Il libro dei conti di Giacomo Badoer (Constantinopoli, 1436–1440),” *Byzantion* 21 (1951): 123–26, esp. 126: “Basta la menzione del cambio vigente per gli aspri di

tists? Another possible solution would be to assume that in the time of Genoese settlement the aspers of Caffa had provided the circulating medium and were still current some sixteen years or more after the fall of the city, at a rate slightly less than that prevailing in Caffa itself.

*Aspers of Tana* Called *tangi* (sing. *tango*), these aspers were rated at one-sixth of the local bezant of account as appears from the account of the venture to Tana and then to Venice recommended to Francesco Corner in 1438.<sup>83</sup> They were called *tangi* from the Tatar *tanga* or *tamga* (manual sign) they bore. They were worth less than the aspers of Caffa (1 tango = ca. 5/6 asper) and must have been a different coinage in spite of their similar iconographical type.<sup>84</sup>

*Rhodes (Ducats and Aspers)* (fig., p. 245) For the shipment to Rhodes and Beirut (13 September 1438–18 May 1439) (c. 243, p. 489), the accounts are kept in ducats and aspers. In the local system described by Pegolotti, 30 aspers went to the “florin”; this ratio apparently still prevailed, since the figures here for aspers and denarii do not exceed 28 and 14 respectively.

Florin	Besant	Gigliato	Asper <sup>85</sup>	Carat	Denier*
1	6 <sup>2</sup> / <sub>3</sub>	10	<b>30</b>	160	720
	1	1 <sup>1</sup> / <sub>2</sub>	3	24	48
		1	2	<b>16</b>	256
			1	8	<b>16</b>
				1	2

\*called by Pegolotti *denaro picciolo*

Note: Boldface type indicates values given by F. Balducci Pegolotti, *La Pratica della Mercatura*, ed. A. Evans (Cambridge, Mass., 1936), 103 (hereafter “Pegolotti”).

Simisso, diverso da quello applicato agli aspri delle vicine regioni turche, per dedurre che colà doveva esistere un regime politico particolare.” This assertion, however, is not confirmed by what is known about the fate of the city in the 15th century (see above, note 59).

<sup>83</sup>C. 283, p. 568, line 1 and p. 569, line 28, and c. 307, p. 616, line 13, where the ducat is rated at 13 bezants and 2 tangi and the various equations (1,280 bezants = 96 ducats) or conversions (6,194 aspers of Caffa rated at 66 to a ducat—thus implicitly equated to 93% ducat—are valued at 1,251 bezants of Tana, which also result in the same rate and justify the [13] restored in the text by T. Bertelè, p. 616, line 13.

There are other occurrences of tangi in the *Libro* which Giovanni Bertelè kindly pointed out to me. In one case, also at Tana, *tango* is clearly a weight or a package unit: on c. 219, p. 441, line 19, it is a fraction of the batiman (100 modioi of millet weighing 2,087 batimani and 3 tangi). The other examples are related to the acquisition of sheepskins (*montonine*) in the Bursa venture (p. 452, lines 7, 9, 13, 15, 18, 25 and p. 457, line 9): the cost of the transport of skins refers to the number of “tangi de mowntonine.” *Tango* is apparently a weight or a container (load).

<sup>84</sup>On the coinage of the Crimean khans, see O. Retowski, “Die Münzen der Girei,” *Trudy Moskovskogo Numizmaticheskogo Obshchestva* 2 (1899–1901): 241–308; 3 (1903–5), 10–107, 187–330 = O. Retowski, *Die Münzen der Girei* (Moscow, 1905; repr. London, 1982). But it seems likely to M. Bates that the earlier Genoese Tatar coinage (see O. Retowski, “Genuezko-Tatarskii moneti goroda Kaffi,” *Izvestiia Imperatorskii Arkheologicheskii Komissii* 18 [1914]: 1–16) might relate more precisely to this entry.

<sup>85</sup>Aspers were struck in the 14th century (cf. D. M. Metcalf, *Coinage of the Crusades and the Latin East in the Ashmolean Museum*, Oxford [London, 1995], nos. 1187–190) and again by Jean de Lastic (1437–54) as silver coins weighing  $\pm$  2.00 g. According to Schlumberger, they were relatively common. They are in fact equal to half a gillat of  $\pm$  4.00 g. Possibly the deniers are identical with the anonymous copper coins inscribed +OSPITALIS/CONUE RODI (0.36–0.76 g), although these are dated by Metcalf (*ibid.*, nos. 1196–1205) to 1319–60.

The final settling of the account (c. 243, p. 489, lines 1–11) states that Badoer will receive for his 50 percent participation 160 ducats, 28 aspers, and 1 denaro,<sup>86</sup> which he reckons in ducats of Venice with a 16 percent tare (*tara*).<sup>87</sup> This is apparently much more important than the difference in fine weight (some 5%) would justify, since according to Grierson and Oddy's analyses most of the ducats struck in Rhodes from Antonio Fluviano (1420–37) on (Schlumberger, *Numismatique de l'Orient Latin*, pl. X, 15) are 23 carats fine.<sup>88</sup>

*Florentine* The gold florin (fig., p. 245) appears only twice in the *Libro*. The first mention is in the account of the shipment to Messina and Syracuse on 22 August 1437, noted earlier regarding the florin of account in the Sicilian monetary system. In this entry the sale of copper (charged on the boat of Todaro Vatazzi of Candia, "signado de mio segno"; c. 40, p. 80, line 5) is shown to have been carried out in real florins.<sup>89</sup> Florentine florins were thus still preferred in this area where they had been predominating over Venetian ducats since ca. 1350, although, according to Grierson and Travaini, citing a hoard from Syracuse deposited ca. 1415 and consisting of 8 ducats and 83 florins, "by 1400 Venetian ducats had become more common in the Regno."<sup>90</sup>

The second entry mentioning the gold florin (c. 317, p. 637, lines 17–19) concerns a *chanbio de firini* or *fiorini*, that is a bill of exchange of 300 florins sent to the Venetian *bailo* in Constantinople (beneficiary/payee): "Miser Zorzi Zorzi bailo de Chostantinopoli diè aver a di 20 marzo 1439 per Miser Piero Michiel e ser Marin Barbo per un chanbio de firini (sic) 300 a perp. 3 car. 7 el fiorin, che azeti de pagar al dito c. 317 perp. 987 car. 12." The rate is the same as that of the ducat for bills remitted to Constantinople (this is obvious since the two currencies were of the same intrinsic value).

*Various (Egyptian, North African, Wallachian)* We find Badoer investing in 1437 in a shipment to Alexandria whose accounts he keeps in ducats reckoned at 2 perperi 10 carats, which are clearly coins of lower metal content than the Venetian. This ducat is presumably to be identified with the local dinar of lower weight (ca. 3.45 g) and fineness (91.3% ± 22 carats) (fig., p. 00).<sup>91</sup> Copper and other items are sold in dirhams valued at 95<sup>92</sup> to the perpero and current in Egypt at 230 (or once as 285) to a ducat ("de duchati

<sup>86</sup>C. 243, p. 489, lines 1–11: "resta neti duchati 321 asp. 24 dr. 2, tocha per la mia mità duc. 160 asp. 28 d. j. che mete valier de<sup>1</sup> veniziani, a 16 per c°. de tara, duc. 137 asp. 28 c. 328 perp. 413<sup>2</sup> car. 18."

<sup>87</sup>"a perp. 3 el duchato cancellato" (T. Bertelè's note) [this is, however, the rate of exchange applied here by Badoer, who probably cancelled it in order to simplify the wording of the entry].

<sup>88</sup>"482 corretto in 413" (T. Bertelè's note).

<sup>89</sup>*Tara* here cannot be tare in the usual meaning, but must indicate a discount applied for deficient quality.

<sup>90</sup>P. Grierson, "The Fineness of the Venetian Ducat and Its Imitations," in *Metallurgy in Numismatics*, vol. 3 (London, 1988), 99.

<sup>91</sup>C. 40, p. 81, lines 6–14, credit. See above, p. 222.

<sup>92</sup>Grierson and Travaini, *MEC* 14:409.

<sup>93</sup>C. 299, p. 600, line 26, although the difference in metal content (ca. 12%) is lower than the difference between rates (1 perp. = 3 Venetian ducats vs. 2 p. 10 car. makes 14 car., i.e., ca. 20%). On the dinar *ashrafi* issued from 1425 on with a weight and fineness inferior to that of the Venetian ducat (3.45 g vs. 3.56 g), see Grierson, "The Fineness of the Venetian Ducat," 95, recalling the eighteen analyses by Bacharach of imitative ducats from Egypt in the names of doges Antonio Venier and Michele Steno (1382–1413) with an average fineness of 91.3% (87–96% extreme values).

<sup>94</sup>C. 56, p. 113, line 6, 1439 (?) August ("Venture to Alexandria" account): "deremi 615 val a deremi 95 a perparo perp 6 car 11."

chorenti da deremi 230 el duc<sup>o</sup>").<sup>93</sup> This cannot be the actual silver dirham, although its issue was resumed from 1415 onward after the silver famine and debasement in the fourteenth century; it is the copper dirham (fig., p. 245) which we know from Egyptian sources to have varied between 240 to a dinar in 1434 and 285 in 1440.<sup>94</sup>

“Double dinars” (*dobra/doble d'oro*) (fig., p. 245) are found in a few entries pertaining to the Sicilian venture mentioned above. These entries are also unique in giving the weight and fineness of the coins. 72 doble were bought in Syracuse for 16 carlini (i.e., 32 taris worth) and one grain each,<sup>95</sup> then brought to Constantinople to Badoer's house, sold to the banker Nicola Sardino only to be resold, through Badoer, to two Venetian correspondents.<sup>96</sup> Double dinars bought in Syracuse are more likely to be *dupli di Barbaria* from Tripoli, Tunis, or Tlemcen rather than Merinid or Nasrid ones from further west, since the former are known to have circulated in Sicily in the fourteenth century.<sup>97</sup> It is the only mention in the whole book giving the weight and fineness of a coin (72 doubles = 80 sazi and 17 carats at 21½ fine, making a double ca. 4.4 g).<sup>98</sup> The reason for giving such detailed information probably lies in the fact that they were rare in Constantinople and not as well rated as other currencies.

The last foreign coins in this group of Mediterranean and Black Sea currencies are *tornesi vlachesci* (Wallachian tornesi), which are probably to be identified with Moldavian copper half-groats of 1400–1437, minute coins weighing some 0.4 g.<sup>99</sup> They were acquired from Jorgi Foti (*vlacho*) on 26 september 1437 at 17 perperi a cantar and formed part of the copper sent to Egypt in 1438.<sup>100</sup> Badoer's phrase “per rame in tor-

<sup>93</sup>C. 56, p. 113, lines 7–9.

<sup>94</sup>E. Ashtor, *Histoire des prix et des salaires dans l'Orient médiéval* (Paris, 1968), 276–79.

<sup>95</sup>C. 375, p. 752, lines 25–28 (“Doble” account's debit to Paolo Quirini for the cost of the 72 doble (“Le qual el mete averli costà in Saragoxa charlini 16 e grana una la dobla, montano onze 19 tari 7 che val a perp. 13 l'onza”).

<sup>96</sup>See the comments in T. Bertelè, “Moneta veneziana,” 116–17.

<sup>97</sup>*Dupli di Barbaria*, which reached the country in quantity through the export of grain: MEC 14:307, citing Trasselli 1959 (as above n. 24) and a document there dated 28.6.1438; see also *ibid.*, 266 and 328.

<sup>98</sup>C. 375 (“Doble” account, p. 753, lines 22–23): “Le doble pexono sazi 80 car 17 e sono de fineza de charati 21 e grane 2, sotosora, a perp. 3 car. 13 el sazo de horo fin de car. 24.” Michael Bates has referred me to H. W. Hazard, *The Numismatic History of North Africa* (New York, 1952), who “found the original dobla [really one mithqal or dinar, but the Spaniards and other Europeans seem to have rated it as the double of the half-dinar] to be 4.68 grams. At least that is the weight standard usually quoted.” “No one to my knowledge,” adds Bates, “has actually done a metrological study of the 14th-century west Maghribi gold coinage to see if the standard was the same.”

<sup>99</sup>These coins were first identified by Iliescu with *bani* (anepigraphic obols of Vlad Dracul (O. Iliescu, “Ducatii Tării Românești cu numele Basarab voievod” [Wallachian ducats in the name of voivod Bessarab], *SCN* 6 (1975): 139–52, esp. 145–46). This is doubted by E. Oberländer-Tărnoveanu, “Moldavian Merchants and Commerce in Constantinople in the 15th Century in the ‘Book of Accounts’ of Giacomo Badoer,” *Etudes byzantines et post-byzantines* 2 (Bucarest, 1991): 165–80. According to Oberländer (175), the initial transaction of copper coins had occurred before 18 December 1436 and thus predate Vlad Dracul's accession in 1436 (but the entries concerning *rame* there do not surely refer to the *tornexi vlachesci*). A more convincing argument lies in the fact that these Wallachian issues were all of silver or billon; the only copper issues of the time (hence Badoer's *tornesi di rame*) in the area being the Moldavian half-groats of Alexander the Good (1400–1432), Elias (1432–37), and those from the first years of the joint reign of Elias and his brother Stephen II (after August 1435), with an average weight of 0.44–0.32 g.

<sup>100</sup>See T. Bertelè, “Appunto sulle monete del Rechenbuch edito da Hunger-Vogel,” *BZ* 56 (1963): 321–27, esp. 325 and n. 10 quoting Badoer's *Libro*: p. 645, lines 13–14; p. 124, lines 25–27; p. 242, line 7; p. 438, lines 8–9.

8 July 1438, c. 218, p. 438, line 8, “Rame” account (giving details of all transportation and packing costs): “per rame in tornexi per l'amontar de chant. 2 r<sup>o</sup> (rotoli) 80 de rame de tornexi vlachesci, a perp. 17½ el chanter monta c. 120 perp 49 car. 0.”

nexi”<sup>101</sup> is revealing of the process: Wallachian tornesi were being traded for their metal value (at 17.5 perperi the cantar).<sup>102</sup>

#### COINS AS BULLION OR COINABLE METAL

The *Libro* contains a few instances in which Badoer traded coins this way, and information on the relative prices of metals can be derived from these operations. Metals, however precious or base and in all possible form, whether in coins, plate, or ingots, were important items in the business of Venetian merchants. In the survey below, as far as possible all the occurrences of metal prices encountered in the document have been collected. But, given the perspective of this study, only “monetary” metals have been considered, iron and tin for instance being left aside.

In the *Libro*, precious metals are measured in pounds and baser ones in cantars. This agrees to a great extent with Pegolotti’s information, according to which, in Constantinople and Pera, “argento in pezzi . . . si vende a libbre, oro in verghe etc., si vendono a saggio,” while *rame* is sold *a centinaia*, and iron, tin, or lead at the cantar.<sup>103</sup>

The cantar of Constantinople or Pera was divided into 100 rotoli<sup>104</sup> according to the Genoese system followed in both places, according to Pegolotti.<sup>105</sup> It was equal to 156 light Venetian pounds (*libri sottile*)<sup>106</sup> or 138½ Florentine pounds.

I have here converted when necessary all measures into pounds, assuming that Badoer was using the pound of Constantinople or that of Pera, which was identical with it.

#### *Gold*

The doble example (“a perp. 3 car. 13 el sazo de horo fin de car. 24”; see c. 375, note 98 above) gives 1 pound of 72 sazi of 3 perperi 13 carats each, valued at 254 perperi 21 carats.

#### *Silver*

Silver appears in different forms, and its value depends on the fineness of its alloy considered below in decreasing order.

*Worked Silver* Silver plate such as spoons, jam-pots (*confetiere*), cups, and the like are mentioned at 30 or 29 perperi the pound.<sup>107</sup>

<sup>101</sup> And elsewhere (c. 62, p. 124, lines 25–26), mentioning the same lot, he feels it necessary to add *tornesi de rame* probably in order to avoid confusion with silver or silver alloyed tornesi.

<sup>102</sup> C. 218, p. 438, line 6.

<sup>103</sup> Pegolotti, 35, 33, 40–41.

<sup>104</sup> E. Schilbach, *Byzantinische Metrologie* (Munich, 1970), 189.

<sup>105</sup> Pegolotti, 48: “Il cantare, la libbra, il saggio di Gostantinopoli e di Pera si è tutt’uno co’ detti pesi de’ genovesi.” See also another 14th-century source, the *Tarifa zoè noticia dy pexi e mexure di luogi e tere che s’adovra marcadantia per el mondo* (Venice, 1925), on the basis of which Schilbach (*Metrologie*, 178, assumes that a pound of 316.748 g was used in Constantinople for weighing silver.

<sup>106</sup> Pegolotti, 50. G. di Antonio da Uzzano, *La Pratica della Mercatura* in G. F. Paganini, *Della decima e di varie altre gravezze . . . della moneta e della mercatura de’ Florentini fino al secolo XVI*, IV (Lisbon-Lucca, 1776; repr. Bologna, 1966), 88, gives the figure of 150 Venetian *libri sottile* to the cantar of Pera.

<sup>107</sup> On 9 October 1436, Badoer sold to the Jew Samaria eight silver spoons weighing 6 oz., 5 s. at 30 perperi a pound for 17 perperi, 2 car. (c. 6, p. 13, lines 20–21). Other instances involving silver plate show on 5 November 1439 three *chonfetiere* and two *taze* weighing a total of 3 pounds and 6 ounces being reserved by the banker Nichola Sardino at 29 perperi the pound (c. 254, p. 511, lines 24–25), [probably ? the three *chonfetiere* and two *taze* weighing 5 marks, 5 ounces, and 2 quarte at 5 ducats, 15 grossi to 6 ducats, 8 grossi, sent by his brother from Venice (c. 254, p. 510, lines 20–23)].

*Silver in aspers* In July 1437, 9 ounces of *arzento d'asperi* had been bought at 25 perperi. On 19 September 1437, 7 pounds of the same are bought in Constantinople from the Jew Leonin at "perperi 26 carats 6 la livra."<sup>108</sup> That these *asperi* are Turkish aspers is shown by the offsetting entry of the account "Cassa/aver de raxon de ser Griguol Contarini" (c. 88, p. 179, lines 19–20), where "200 asperi grievi" weighing 1 pound 1 ounce and 5 s. (i.e., some 367.30 g) imply an asper at ca. 1.83 g (reckoning with a pound of 318.7 g). This identification is confirmed by the valuation of the same *asperi grievi* at 18 perperi 18 carats, implying 1 perpero = 10½ aspers, that is, the average rating of the *akče* (see above, pp. 228–29).

*Silver plate (in piatine)* These aspers are exported to Trebizond together with silver plate (*Arzento de piatine*) at 24 perperi 21 carats, on which Badoer takes a discount of 1 percent as his commission for buying and weighing ("per provixion de me de l'achatar e pexador").<sup>109</sup> The *piatine* must have been silver plaques which could either be melted on arriving at their destination or circulate along with the silver *sommo* or the related, more or less standardized ingots popular around the Black Sea.<sup>110</sup> The *piatine* are valued at 24 perperi 21 carats the pound. Badoer's *piatine* are of different weights: the first two are 14 pounds, 9 oz., 5½ d., that is, 4.7 kg each (at a 317 g pound); the other, 10 pounds, 5 oz., 2½ d., that is, 3.31 kilos.<sup>111</sup> The former could be a multiple of the Genoese mark (237.58 g), but, as Spufford rightly points out, "the fact that two of the plates weighed around twenty marks between them does not mean that they each weighed around ten marks."<sup>112</sup>

*Copper* Badoer's trade in copper deserves a more detailed study since many entries in fact pertain to his affairs in this very desirable metal. He shipped copper in all directions, westward or eastward alike, to Venice, Sicily, Modon or Candia, Alexandria, Rhodes, Beirut on its way to Damascus, as well as to Tana. But coins exported for their metal value play a minor part in this active business. Only one type of coins was treated this way and exported in the 1438 consignment to Alexandria together with 11 *cofe* (baskets)

<sup>108</sup> See respectively c. 66, p. 132, lines 36–37 and c. 106, p. 215, line 26.

<sup>109</sup> C. 66, p. 132, line 35 and c. 77, p. 157, line 24

<sup>110</sup> On the increasing use of these ingots in the 14th–15th century after the disappearance of Byzantine gold, see P. Spufford, *Money and Its Use in Medieval Europe* (Cambridge, 1988), 220–22, mentioning, among other things, the 92 *sommi* in the Romanian find of Uzun Bair with weights ranging from 172 g to 219 g.

<sup>111</sup> The following calculations assume Badoer is using the Constantinople/Pera pound, divided into 12 ounces and 72 soldi:

c. 66, p. 132, line 31: "piatine 2 pexa livre 14 once 9 s. 5½" [2 piat. = 14.82 l. hence, 1 piatina = 7.41 l. ± 2,349 g]

c. 66, p. 132, lines 33–34: "una piatina . . . pexò livre 10 once 5 s. 2½" [1 piat. = 10.452 l. ± 3,313 g].

<sup>112</sup> Western medieval silver ingots, whether "marks" or other weights, are known from textual and archaeological evidence (Spufford, *Money and Its Use*, 209–24). A. von Loehr, "Probleme der Silberbarren," NZ, N.F. 24 (1931): 101–9 publishes a series of Germanic ingots of the 13th–15th century, giving their fineness and weight. Because of the high variation of the latter, Loehr avoided proposing any correspondence with a known mark. Let me, however, remark that some of them are grouped in the 200–230 g bracket. Note also that silver ingots weighing "ten marks" (about 2.45 or 2.25 kg) called *iascot* (Turkish *yaštıç*) were used in Karakorum in the mid-13th century (William of Rubruck, *Itinerarium*, trans. W. W. Rockhill [London, 1900] 156, and other secondary references given by Hendy, *Studies*, 550). Spufford points to "much heavier plates of silver being cast in the thirteenth century at Lucca" (oral communication).

TABLE 1. RELATIVE PRICES OF METALS IN BADOER'S *LIBRO*

	Gold	Silver	Copper	Lead
Price of a pound in perperi	254 perperi, 21 carats	30 perperi <sup>1</sup> 26.25 perperi <sup>2</sup>	0.166 perpero	0.0362 perpero
Resulting ratio	1	8.5	1,535	7,040

<sup>1</sup>Worked silver<sup>2</sup>For less fine *arzento d'asperi*

Note: This table sums up data arrived at from the various entries discussed in the text, pp. 235–37 and continued on p. 240.

of noncoined metal: *tornexi*, the Wallachian coins mentioned earlier, probably also called *folari*,<sup>113</sup> assembled in a *baril* also called *charatelo* (cask). Grierson was right in finding it difficult to admit that these *folari* could be the small coins of some 0.80–0.60 g, issued from John V to Constantine XI:<sup>114</sup> “since token coin is always worth more at home than abroad it seems unlikely that he [Badoer] would have been exporting something current at Constantinople. More probably the *follari* were miscellaneous copper coins of varied origin which had been allowed to accumulate and for which Badoer had no use.”<sup>115</sup> It should be noted that the Mamluks of that time were striking such enormous quantities of copper coins, the then dominant currency in Egypt, that they were sending middlemen to Europe to provide them with the much-needed material.<sup>116</sup> Badoer may have found it necessary to form his consignment of copper with whatever metal, even coined, he could lay his hands on. He thus bought, at 17 perperi the cantar, 2 cantars and 80 rotoli (ca. 140 kg) of copper in *tornexi*,<sup>117</sup> which were valued at 17½ perperi in July 1438.<sup>118</sup> The price of copper in coins is similar to that of copper in ingots (*piatine*), also

<sup>113</sup> Badoer, c. 321, p. 645, line 14 (16 October 1439): “per el viazo d’Alexandria rechomandado a ser Lunardo Grimani, per nolo e spexe ch’el me asigna aver fate per cofe 11 de rame e baril uno de folari perp. 13 g° (grossi) O p° (pizoli) 24, che val . . . perp 8 car. 17.” This entry unfortunately refers to the price of the freight charges and other expenses but not to the acquisition price of the *folari*. Analysis of the many entries regarding the trading of copper in the 1438 venture to Alexandria shows this *baril de folari* to be in fact identical with the *charatelo uno de tornexi [vlachesci]* weighing 2 cantars and 80 rotoli bought from the Vlach Jorgi Foti in September 1437.

<sup>114</sup> John V (S. Bendall, *A Private Collection of Palaeologan Coins* [Wolverhampton, 1988], 331): see *DOC* 5.1:203; Constantine XI: Paris, Bibliothèque nationale de France, unpublished.

<sup>115</sup> Grierson, *DOC* 5.1:27.

<sup>116</sup> See Ashtor, *Histoire des prix*, 279–80, with references. More recently, B. Shoshan, “From Silver to Copper: Monetary Changes in Fifteenth-Century Egypt,” *Studia Islamica* 56 (1982): 97–118, analyzed the emergence of copper as currency in 15th-century Egypt following the dependence of the country on western supply of precious metals and the growing general shortage of silver in Europe in the 14th century. In turn, the abundant monetization of copper created a copper shortage during a large part of the 15th century, particularly acute during the 1420s and 1430s, precisely when Badoer was shipping a significant amount of metal to Alexandria.

<sup>117</sup> C. 119, p. 241, lines 2–3: “per rame de tornexi per l’amontar de chant. 2 rot. 80 di rame neto, a perp. 17 el chanter monta a 47 perp. 14 car.” gives 1 cantar at 17 perperi [100 pounds = 17 perperi; 1 pound = 0.17 perpero, i.e., ca. 1/6 perpero, making 1 pound = 4 carats].

<sup>118</sup> C. 218, p. 438, lines 8–9.

TABLE 2. RATES OF EXCHANGE IN BADOER'S *LIBRO DEI CONTI*\*

## 1. Moneys of Account

Genoese ducats (ducats of Pera) (weight and gold content unknown)

= "2 perperi"

= "71 Trebizond aspers" [i.e.,  $\leq \frac{1}{2}$  Venetian ducat] (metal worth)

Byzantine perperi

1 perpero = 24 carats = 96 quarte (1 carat = 4 quarte)

Cretan perperi [de Chandia]

1 perpero = 12 grossi = 384 piccoli (1 grosso = 12 piccoli)

1.5 to the Constantinople perpero [=  $\frac{2}{3}$  perpero of Constantinople], i.e.,  $\frac{2}{9}$  of a gold ducat

Morean perperi [de Coron]

1 perpero = 20 soldi di piccoli and 240 piccoli (1 soldo = 12 piccoli)

2 $\frac{1}{4}$  to the Constantinople perpero, i.e., ( $\frac{2}{3}$ ) of Cretan ones

Bezant of Tana

divided into 6 aspers

1 [Venetian] ducat = 13 $\frac{1}{3}$  bezants (13 bezants and 2 tangi)

1 perpero = 4 $\frac{1}{4}$  bezants

Sicilian gold ounce divided into 30 tari or tareni of 20 grains each

Ounce	[Florin]	Tari	Grain
1	5	30	600
	1	6	120
		1	20

## 2. Actual Coins

Byzantine perperi ( $\pm$  90% fine silver)

1 perpero = [2 "stavrati" 7.1 g silver] = 4 intermediate coins  $\pm$  3.5 g = 16 ducatelli  $\pm$  0.9 g  
 $\pm$  3 perpero, 6 carats to the Venetian ducat

Venetian ducats

3.56 g of 99% fine gold

Turkish ducats (gold) (weight and gold content unknown)

ca. 2 perperi, 1 carat

[1 Venetian ducat = 1.5 Turkish ducat]

"1 Turkish ducat = 36 aspers of Simisso"

"1 Turkish ducat = 80 Trapezuntine aspers"

Turkish aspers (*akčes*)

( $\pm$  1.06 g of 90–95% fine silver)

various rates ca. 11 to the perpero

Trapezuntine aspers

$\pm$  1 g of 51% fine silver  $\pm$  36 to the perpero

\*This table sums up the rates arrived at from the various entries discussed in the text, pp. 220–35.

TABLE 2. RATES OF EXCHANGE IN BADOER'S *LIBRO DEI CONTI* (*continued*)

## Sommo (Caffa)

± 200–205 g = 9 perperi, 6 carats and 10 perperi, 9 carats  
 = 202½ aspers

## Aspers (Caffa)

0.56–1.00 g, silver content unknown  
 1 perpero = 20 aspers [i.e., 0.64–0.73 g fine silver weight]  
 1 [Venetian] ducat = 66 aspers (c. 307, p. 616, line 12)

## Aspers of Simisso

1 Turkish ducat = 36 aspers of Simisso  
 1 perpero = 19 aspers of Simisso

Aspers (*tangi*) (Tana)

1 bezant (account) = 6 tangi  
 1 [Venetian] ducat = 13 bezants + 2 tangi  
 1 tango = 0.82 i.e., ± ¼ asper of Caffa; 1 asper of Caffa = 1½ tango

## Ducats and aspers of Rhodes

1 ducat (ca. 3.5 g at 23 carats fine [95.8%]) = 30 aspers (± 2.0 g)  
 1 asper = 16 denari  
 "1 ducat of Rhodes = 1 Venetian ducat – 16 percent *tana*" (discount)

## Florentine florins

1 florin = 3 perperi, 7 carats

## Egyptian ducats and dirhams

1 ducat = 2 perperi, 10 carats  
 1 dirham = 1/95 perpero

North African *dobra* (double dinar)

bought for 16 carlini, 1 grain in Syracuse  
 reckoned in Constantinople at ca. 3 perperi, 13 carats each

## 3. Metals

## Gold

1 pound pure gold = 254 perperi, 21 carats

## Silver

1 pound worked silver = 30 to 27 perperi  
 1 pound *arzento d'asperi* (Turkish aspers) = 26 perperi, 6 carats or 25 perperi  
 1 pound *perperi grieve* = 23 perperi, 4 carats, 22 perperi, 15 carats, 22 perperi, 12 carats

## Copper

*rame de tornexi*: 1 cantar = 17 perperi [hence, 1 pound = 4 carats]  
*chofe de rame (folari, tornexi, piatine)*: 1 cantar = 17–15 Alexandria ducats

## Lead

1 cantar = 3.62 perperi = 3 perperi, 18 carats = 90 carats

TABLE 2. RATES OF EXCHANGE IN BADOER'S *LIBRO DEI CONTI* (*continued*)

4. Resulting Exchange of the Bezant and Ducat in Other Currencies or Moneys of Account	
The Byzantine perpero in	
ducats of Venice	1/3 to 1/4 (1/4 + 1/18)
ducats of Pera	1/2
Cretan perperi	1 1/2
Morean perperi	2 1/4
Turkish ducats	< 1/2 (1 Turkish ducat = 1 perpero + 1 carat)
Turkish aspers	11
Trapezuntine aspers	33 1/3 to 36
sommo of Caffa	ca. 1/10
aspers of Caffa	20
aspers of Simisso	19
bezants of Tana	4
Egyptian ducat	5/12
Egyptian dirhams	95
The Venetian ducat in	
Byzantine perperi	3 to 4
ducats of Pera	1 2/3
Cretan perperi	4 5/6
Morean perperi	7 1/3
Turkish ducats	1 1/2
Turkish aspers	35 3/4
sommo of Caffa	ca. 3 (2 ducats, 10 grossi to 3 ducats, 4 grossi and 16 piccoli)
aspers of Caffa	66
bezants of Tana	13 1/3 (13 and 2 tangi)
Egyptian dirhams	230 and once 285

usually rated at 17 perperi a cantar and only in a few cases at 18 perperi.<sup>119</sup> One should note that, by selling at 15 or 16 local Egyptian ducats the cantar of copper, he was making a good profit, roughly more than doubling his original investment.

Not all the numerous currencies in which Badoer, or rather his correspondents, traded were used as a means of payment. The present survey may be concluded by noting that for the Venetians of that time coins were just another type of metal and exporting them even from their own country was not regarded as detrimental to the economy (see the Deathbed Oration of Doge Mocenigo<sup>120</sup>) as the mercantilist and bullionist theory and practice would later have it.

<sup>119</sup>C. 133, p. 269, lines 14–15: “a dì 6 zugno 1439 per rame de raxon de ser Zuane e ser Jachomo Bragadin per l'amontar de chant. 50 r° 94 de rame a perp 18 el chanter, tempo al retorno de le galie de Mar Mazor de 1439 . . . perp. 916 car. 22.” If 1 cantar = 18 perperi [100 pounds = 18 perperi; 1 pound = 0.18 perpero = 1/6 + 1/8 perpero], 1 pound = 4 1/3 carats.

<sup>120</sup>The text mentions that some 5,000 marks of silver (= 30,000 ducats) were annually exported to Egypt and Syria and 50,000 ducats worth to the Venetian colonies; A. Stahl, “The Deathbed Oration of Doge Mocenigo and the Mint of Venice,” *Mediterranean Historical Review* 10.1/2 (1995): 284–301; F. C. Lane, “Exportations vénitiennes d'or et d'argent de 1200 à 1450,” in *Etudes d'histoire monétaire*, ed. J. Day (Lille, 1984), 29–48, repr. in Lane, *Studies in Venetian Social and Economic History* (London, 1987), XIV. Other data are collected in E. Ashtor, *Les métaux précieux et la balance des paiements du Proche-Orient à la basse époque* (Paris, 1971).

## Appendix

A page of the *Libro* and its edition (*carta* 33, p. 66, lines 1–27). Two credit accounts are illustrated; that of the pepper bought in Bursa for Badoer and Nicolo Justignan (lines 1–15); and that of Christofal Bonifazio, Badoer's correspondent in Bursa (lines 16–27).



1) *Il corretto in 5 è ricorso:to in 2. - 2) 114 corretto in 115. - 3) Invece di car. 10 1/2.*

*Specimens of denominations mentioned (real size)*

**Byzantine coins**

Stavraton, John VIII (1423–48) (S. Bendall and P. J. Donald, *The Later Palaeologan Coinage* [London, 1979], p. 172, 1).  
 Half-stavraton (ibid., p. 172, 2)  
 Duchatello (½ stavraton) (ibid., p. 174, 3)  
 Tornexe, Manuel II (1391–1425) (ibid., p. 163, 3)

**Venetian ducat**

Francesco Foscari (1423–57) (N. Papadopoli, *Le monete di Venezia* [Venice, 1893], p. 269, no. 1, pl. XIV, 1)

**Turkish asper (akçe)**

Murad II (825 H/1422 A.D.), Edirne (W. Marsden, *Numismata Orientalia illustrata*, vol. 1 [London, 1823], pp. 381–82, pl. XXIII, no. CCCLXXXVI)

**Trapezuntine asper**

Alexios IV (1417–47) (P. J. Sabatier, *Description générale des monnaies byzantines* [Paris, 1862], pl. LXIX, 25)

**Genoese ducat (ducat of Pera)**

Thomas Campofregoso, doge of Genoa (1436–43) (G. Schlumberger, *Numismatique de l'Orient Latin* [Paris, 1878], p. 454, pl. XVII, 22)

**Genoese asper of Caffa**

Bilingual issue with the Genoese castle (*janua*) and the Tartar tanga (Schlumberger, *Numismatique de l'Orient Latin*, p. 466, pl. XVII, 25 = G. Lunardi, *Le monete delle colonie genovesi* [Genoa, 1980], p. 73, C28)

**Asper (tangi) (Caffa)**

Silver coin with tanga on reverse and inscription: “struck in the city of Crim, in 845” (O. Retowski, *Die Münzen der Girei* [Moscow, 1905], p. 4, pl. 1, 1)

**Ducat and asper of Rhodes**

Ducat, Antonio Fluviano (1421–37) (Schlumberger, *Numismatique de l'Orient Latin*, p. 255, pl. X, 15)  
 Asper, Jean de Lastic (1437–34), (ibid., p. 256, pl. X, 16)

**Florentine florin**

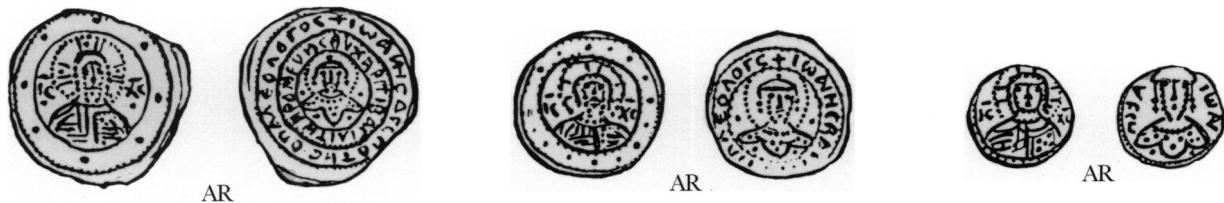
Florin (1436) (*Corpus Nummorum Italicorum*, vol. 12, *Toscana. Firenze* [Rome, 1930], p. 129, pl. XVII, 46)

**Egyptian ducat and copper dirham (drawings by F. Thierry)**

Ducat, Cairo. Barsbay (825/1422–841/1438) (H. Lavoix, *Catalogue des monnaies musulmanes de la Bibliothèque Nationale*, vol. 3, *Egypte et Syrie* [Paris, 1896] no. 988)  
 Copper, Haleb, Barquq (784/1382–801/1399) (Lavoix, ibid., no. 958; illustrated here in the absence of any Egyptian copper dirham of the period in the Paris collection)

**North African *dobra* (double dinar) (drawing by F. Thierry)**

Tunis, Abul-Faris 'Abdal Aziz II (839/1435–), (Lavoix, *Catalogue*, p. 271, no. 969, pl. CXCI, no. 5)



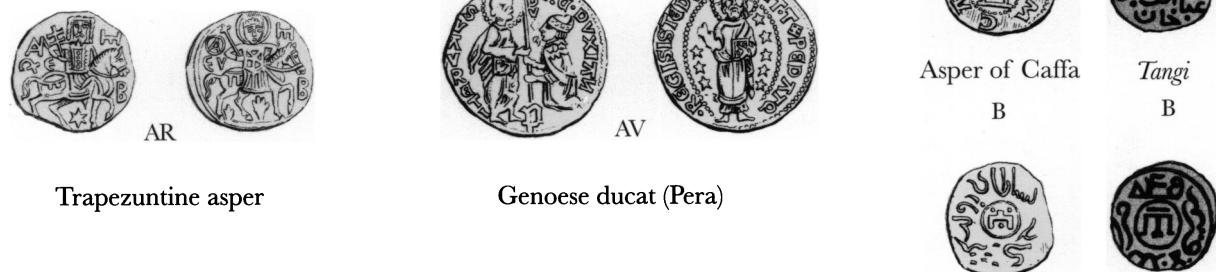
Byzantine coins (stavraton and fractions)



Byzantine tornexe

Venetian ducat

Turkish *akçe*



Trapezuntine asper

Genoese ducat (Pera)

Asper of Caffa

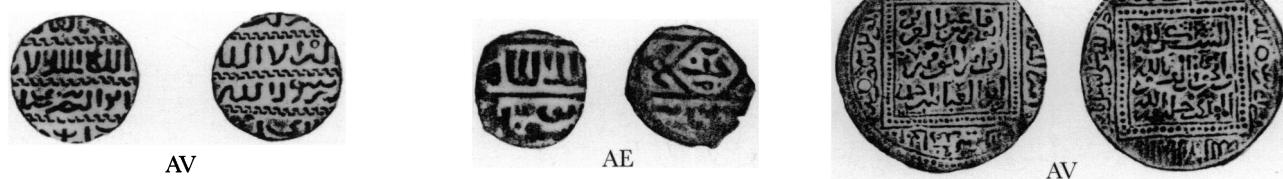
*Tangi*



Ducat of Rhodes

Asper of Rhodes

Florentine florin



Egyptian ducat

Copper dirham

North African *dobra*